



Minnesota Pollution Control Agency

520 Lafayette Road North
St. Paul, MN 55155-4194

**UST Cathodic Protection System Evaluation
Galvanic (Sacrificial Anode) Type**

Underground Storage Tanks (UST) Program

Doc Type: Compliance Certification

6 month follow-up on CP test - (Defect)

Instructions: Within 30 days, send completed form to Joann Henry, Minnesota Pollution Control Agency (MPCA) at the address above, fax to 651-297-2343, or e-mail joann.henry@state.mn.us.

- All reports must be submitted regardless of results (pass, fail, or inconclusive)
- Incomplete, unsigned, or illegible forms will not be accepted and will be returned.

1. UST facility MPCA Site ID #: 14673
Name: Meleen's Sports Center BP
Address: 38666 Highway 169
City: Onamia Zip code: 56359
County: Mille Lacs Phone: 320-237-0097
Contact name (if different than above): Paul Meleen

2. UST owner/operator
Name: _____
Address: _____
City: _____ State: _____
Zip code: _____ Phone: _____
Contact phone: 320-237-0097

3. Cathodic Protection (CP) tester information and qualifications

Tester name (print): Mike Reneau Company name: Advanced Corrosion Control Technologies, Inc.
Address: 2519 47th Court City: Kenosha
State: WI Zip code: 53144 Phone: 262-652-0417 E-mail: tsievert@wi.rr.com
National Association of Corrosion Engineers (NACE) international certification #: 22874 Steel Tank Institute (STI) certification #: _____

4. Reason survey was conducted (check only one)

- ☐ Routine - 3 years ☐ Routine - within 6 months of install ☐ 30-day re-survey after fail ☒ Re-survey within 6 months of repair/modification
Date next CP survey must be conducted by (mm/dd/yyyy): 4/1/2013 (Required within 6 months of install or repair, and every 3 years thereafter.)

5. CP tester's evaluation (check only one)

- ☒ **Pass** All protected structures at this facility pass the CP survey and the continuity survey indicates all protected structures are isolated. It is judged that adequate CP has been provided to the UST system (Complete sections 7 and 8).
- ☐ **Fail** One or more protected structures at this facility fail the CP survey, and it is judged that adequate CP has not been provided to the UST system. (Complete sections 7 and 8).
- ☐ **Inconclusive** The remote and the local do not both indicate the same test result on all protected structures (both pass or both fail), or the continuity survey indicates continuous or inconclusive results when compared to non-protected structures, the survey must be evaluated by a corrosion expert (Corrosion Expert to complete section 6).

CP Tester Signature: [Signature] Date CP survey performed (mm/dd/yyyy): 10/4/2012

6. Corrosion expert's evaluation (if applicable)

The attached survey must be conducted and/or evaluated by a corrosion expert when: a) conducting repairs to metallic structures which are non-factory coated with dielectric material; b) adding supplemental anodes to the tanks and/or piping without following accepted industry standards; c) the local and remote structure-to-soil potential did not result in the same outcome (both pass or both fail); d) the continuity survey indicates one or more of the protected structures are not isolated; e) when required by MPCA (Corrosion Expert to complete sections 7 and 8).

- ☒ **Pass** All protected structures at this facility have been judged that the adequate CP is provided to the UST system.
- ☐ **Fail** One or more protected structures at this facility fail the CP survey and it is judged that adequate CP has not been provided to the UST system.

Corrosion expert's name (print): Tim Sievert Phone: 262-652-0417
Company name: Advanced Corrosion Control Technologies, Inc.
NACE Int./PE certification: C.P. Specialist NACE Int./PE certification #: 5008
CP Expert Signature: [Signature] Date (mm/dd/yyyy): 10/6/2012

7. Criteria applicable to evaluation (check all that apply)

- ☒ **-850 On** Structure-to-soil potential more negative than -850 millivolts (mV) with the protective current applied.
- ☐ **-850 Off** Structure-to-soil potential more negative than -850 mV with the protective current momentarily interrupted. ("Instant Off")
- ☐ **100 mV** Structure tested exhibits at least 100 mV of cathodic polarization. ("Instant Off" readings minus native/depot readings)

11. Description of UST system

Tank/ Pipe #	Product	Capacity (Gallons)	Tank type ¹	Piping type ²	Metal Segments at Tank sump ³	Metal Segments at Dispenser ³
1	RUL Gasoline	12,000	SW Sti-P3	Steel w/CP		
2	MUL Gasoline	12,000	SW Sti-P3	Steel w/CP		
3	PUL Gasoline	12,000	SW Sti-P3	Steel w/CP		
4	DSL Diesel	12,000	SW Sti-P3	Steel w/CP		
5						
6						
Ex:	Premium	10,000	SW sti-P ₃ [®]	DW Fiberglass	CP w/ anodes	In Containment

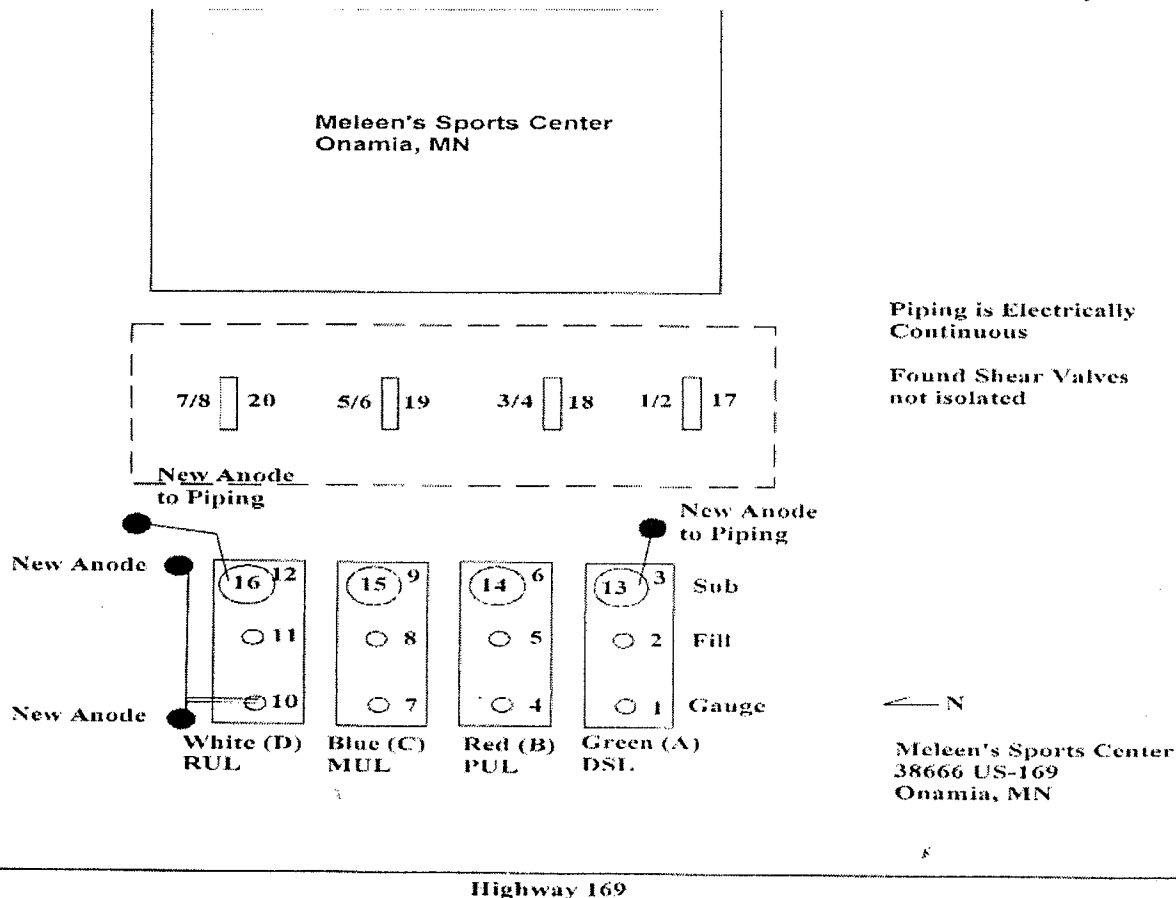
1. Indicate if tank is Double Wall (DW) or Single Wall (SW). Also indicate type (e.g., steel, fiberglass, sti-P₃[®], composite etc.). Also indicate if tank is compartmental if applicable
2. Indicate if piping is Double Wall (DW) or Single Wall (SW). Also indicate type (e.g., coated steel, fiberglass, galvanized, flex, etc.).
3. Indicate how metal segments such as flex connectors or metal pipe segments are protected from corrosion (e.g., isolated, booted, bonded, CP w/anodes, in containment, etc.)

12. UST facility site drawing

Attach detailed drawing or use the space provided to draw a sketch of the UST and CP systems. At a minimum you should indicate the following: All tanks, piping and dispensers; Location of anodes if known; All buildings and streets; Location of CP test stations; Each reference cell placement (local and remote) must be indicated by a code (e.g., 1,2, T-1,) corresponding with the appropriate test in Section 10 of this form. If supplemental anodes are added to the tank system, indicate number, size, location and depth of the new anodes. An evaluation of the CP system is not complete without an acceptable site drawing.



[Indicate North Here]



Facility name: Meleen's Sports Center BP

Date of test (mm/dd/yyyy): 10/4/2012

(Note: The facility name and date of test will automatically populate from page one, if filled out electronically.)

Structure to soil potentials (mV)				Continuity testing (mV)			
	Half cell site map code	Half cell placement description	"ON" Voltage	Structure tested	Point-to-point voltage	Fixed cell remote voltage	Isolated/Continuous/Inconclusive
Structure: Product Piping	17	Product Piping at Disp 1/2	-1110				Isolated
	18	Product Piping at Disp 3/4	-1125				Isolated
	19	Product Piping at Disp 5/6	-1059				Isolated
	20	Product Piping at Disp 7/8	-1100				Isolated
	Structure contact point(s): Product Piping						
Overall Structure Results (Structure to soil potentials and continuity): <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Inconclusive							
Structure:							
	Structure contact point(s):						
Overall Structure Results (Structure to soil potentials and continuity): <input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Inconclusive							
Structure:							
	Structure contact point(s):						
Overall Structure Results (Structure to soil potentials and continuity): <input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Inconclusive							
Structure:							
	Structure contact point(s):						
Overall Structure Results (Structure to soil potentials and continuity): <input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Inconclusive							
Structure:							
	Structure contact point(s):						
Overall Structure Results (Structure to soil potentials and continuity): <input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Inconclusive							

Comments/Remarks:

If separate corrosion protection is required on flex connectors, treat each flex as if it were an individual metal pipe.

Attach additional sheets as needed.

Describe soil type and location(s) of remote reference cell placement(s) (e.g., Black Dirt, 30 feet NW of Tank #1 spill bucket):

Remote location #1:

Remote location #2:

Describe soil type(s) of local reference cell placements: Sand/Gravel

Structure to soil potentials (mV)				Continuity testing (mV)			
	Half cell site map code	Half cell placement description	"ON" Voltage	Structure tested	Point-to-point voltage	Fixed cell remote voltage	Isolated/Continuous/Inconclusive
Structure: <u>(Example) Tank 1</u>	(Ex)1	Local, soil at ATG manway	-1011 mV	(Ex) ATG Conduit	475 mV		isolated
	(Ex)2	Local, Soil at STP manway	-995 mV	(Ex) STP conduit		-528 mV	isolated
	(Ex)R-1	Remote #1	-1042 mV	(Ex) Vent	421 mV		isolated
	Structure contact point(s): (Ex) Tank Bottom			(Ex) Fill Riser	375 mV	-522 mV	isolated
Overall Structure Results (Structure to soil potentials and continuity):				<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Inconclusive			
Structure: <u>Green Tank (DSL)</u>	1	Soil Access Gauge End of Tank (W)	-992				Isolated
	2	Soil Access in Center of Tank	-981				
	3	Soil Access on Sub End of Tank (E)	-1011				
	Structure contact point(s): Tank Test Lead						
Overall Structure Results (Structure to soil potentials and continuity):				<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Inconclusive			
Structure: <u>Red Tank (PUL)</u>	4	Soil Access Gauge End of Tank (W)	-1001				Isolated
	5	Soil Access in Center of Tank	-971				
	6	Soil Access on Sub End of Tank (E)	-1053				
	Structure contact point(s): Tank Test Lead						
Overall Structure Results (Structure to soil potentials and continuity):				<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Inconclusive			
Structure: <u>Blue Tank (MUL)</u>	7	Soil Access Gauge End of Tank (W)	-998				Isolated
	8	Soil Access in Center of Tank	-979				
	9	Soil Access on Sub End of Tank (E)	-1087				
	Structure contact point(s): Tank Test Lead						
Overall Structure Results (Structure to soil potentials and continuity):				<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Inconclusive			
Structure: <u>White Tank (RUL)</u>	10	Soil Access Gauge End of Tank (W)	-1341				Isolated
	11	Soil Access in Center of Tank	-1138				
	12	Soil Access on Sub End of Tank (E)	-1260				
	Structure contact point(s): Tank Test Lead						
Overall Structure Results (Structure to soil potentials and continuity):				<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Inconclusive			
Structure: <u>Product Piping</u>	13	Piping at Green (DSL) Tank Sub	-1182				Isolated
	14	Piping at Red (PUL) Tank Sub	-1170				Isolated
	15	Piping at Blue (MUL) Tank Sub	-1089				Isolated
	16	Piping at White (RUL) Tank Sub	-1149				Isolated
Structure contact point(s): Product Piping							
Overall Structure Results (Structure to soil potentials and continuity):				<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Inconclusive			

8. Action required as a result of this evaluation (check only one)

- ☒ **None** CP is adequate. No further action is necessary at this time. Test again by no later than (see Section 4).
- ☐ **Retest** CP may not be adequate. Retest within 30 days to determine if passing results can be achieved. (Retests may occur only if all protected structures are isolated from non-protected structures)
- ☐ **Repair & Retest** CP is not adequate. Repair/modification is necessary within the next 60 days, or permanently close the tank system.

9. CP system repairs and/or modification information

Date of "failing" test: _____ Date of repair: 10/4/2012 Repair company: Advanced Corrosion Control Technologies,
(mm/dd/yyyy) (mm/dd/yyyy)

Name of lead repair technician:

Mike Reneau

Phone # 262-652-0417

Certification of repair technician (check all that apply): ☐ Steel Tank Institute ☒ NACE ☐ MPCA certified supervisor

Note: submit failing test results with this report if not already submitted.

Description of Repairs (check all that apply)

- | | |
|---|---|
| <input checked="" type="checkbox"/> 1. Supplemental anodes for a sti-P ₃ [®] tank. | Repairs/modifications for 1 & 2 must be designed by a "corrosion expert" or installed per industry standards. Attach corrosion experts design, or documentation industry standard was followed. (Section 6 must be signed if designed by a corrosion expert.) |
| <input type="checkbox"/> 2. Supplemental anodes for metallic pipe which is factory coated with dielectric material (fusion bonded epoxy or equivalent). | |
| <input type="checkbox"/> 3. Supplemental anodes for a non-sti-P ₃ [®] tank. (e.g., bare steel). | Repairs/modifications for 3 & 4 must be designed and evaluated by a corrosion expert only. Attach a corrosion experts design. (Section 6 must be signed.) |
| <input checked="" type="checkbox"/> 4. Supplemental anodes for metallic pipe which is non-factory coated with dielectric material (e.g., galvanized, copper, bare steel, etc.). | |
| <input checked="" type="checkbox"/> 5. Isolation of Galvanically protected tanks/piping. (explain in "remarks/other" below). | |
| <input type="checkbox"/> 6. Isolation of non-protected metal pipe segments (e.g., flex connectors) at STP or dispenser sumps (explain in "remarks/other" below). | |

Remarks/Other: Found Shear Valves not isolated from Dispensers. Needed to remove brackets and install isolating material.

Added two (2) Sacrificial Anodes to Product Piping and two (2) Sacrificial Anodes to White (RUL) UST.

10. Galvanic (sacrificial anode) structure to soil potential and continuity survey

Half Cell Placement (testing) on frozen soil, concrete, asphalt, or other paving materials is not acceptable.

Structure to Soil Potentials:

- The half cell must be placed in a minimum of three locations per tank, and three locations per piping run. At least one of the reference cell locations must be in the soil directly over the tested structure (local); and at least one must be placed in soil approximately 25 to 100 feet away from the structure (remote). The third location is at the discretion of the tester (either local or remote).
- When testing flex connectors only, two tests points are required for each flex connector, one local and one remote.
- Both the local and the remote voltage must meet one of the three criteria listed in section 7 in order for the structure to pass. Inconclusive must be indicated when both the local and the remote structure-to-soil potentials do not result in the same outcome (both pass or both fail).
- If the "-850 mV Off" or the "100 mV Polarization" criteria is used for galvanic systems, record structure-to-soil potential readings on the MPCA Impressed Current data sheet or similar form.

Continuity Testing: (Point-to-Point and/or Fixed Cell-Moving Ground)

- Point-to-Point: When conducting this method, the leads of the volt meter are required to contact the two structures being examined to demonstrate isolation or continuity. A half cell is not used for this test method.
- Fixed Cell-Moving Ground: When conducting this method, the half cell must be placed in the soil at a remote location approximately 25 to 100 feet away and left undisturbed. The other lead of the meter is moved to structures being evaluated.
- To interpret continuity data for either method compare the difference in voltage of the structures evaluated and use the following guidelines: 1 mV or less = continuous, 1-10 mV = inconclusive, greater than 10 mV = isolated.
- For galvanic systems, the structure that is to be protected must be isolated from all other non-protected metallic structure in order to "pass" the continuity survey.
- If other approved continuity testing methods are used, alter this form or submit the data on a separate sheet.